Department of Electrical and Computer Engineering
Checklist for Ph.D. Minor in ECE

Officer name: _____; e-mail: _____

Month/year enrolled: _____

I certify that the information contained on this form is correct.

Officer-student :_____

We certify that this student has met the minimum requirements for a Ph.D. Minor in ECE.

Signatures:

_____ _____
ECE Ph.D. Committee Member Date

_____ _____
ECE Department Chairman Date

Program of Study: (Select an option and check all courses taken):

- Option selected: _____

Communications Systems:

Required Courses:

	EC 3500	Analysis of Random Signals	(4-0)
	EC 3510	Communications Engineering	(3-1)
	EC 4550	Digital Communications	(4-0)
	EC 4580	Coding and Information Theory	(4-0)

At least one of:

	EC 4500	Advanced Topics in Communications	(3-0)
	EC 4570	Signal Detection and Estimation	(4-0)

At least one of:

	EC 4510	Cellular Communications	(3-0)
	EC 4560	Communications ECCM	(3-2)

Computer Systems

Any three of:

	EC 3800	Microprocessor Based System Design	(3-2)
	EC 3820	Computer Systems	(3-1)
	EC 3830	Digital Computer Design Methodology	(3-2)
	EC 3840	Introduction to Computer Architecture	(3-2)

At least two of:

	EC 4800	Advanced Topics in Computer Engineering	(3-0)
	EC 4810	Fault Tolerant Computing	(3-2)
	EC 4820	Advanced Computer Architecture	(3-1)
	EC 4830	Digital Computer Design	(3-1)
	EC 4840	Advanced Microprocessors	(3-1)
	EC 4850	High Speed Networking	(3-2)
	EC 4870	VLSI Systems Design	(3-2)

Electromagnetic Systems Option:

Required Course:

	EC 3600	Electromagnetic Radiation, Scattering, and Propagation	(3-2)

At least one of:

	EC 3210	Introduction to Electro-Optical Engineering	(3-1)
	EC 3610	Microwave Engineering	(3-2)
	EC 3630	Radiowave Propagation	(3-0)
	EC 3650	Computational Electromagnetic Modeling Techniques	(4-1)

At least two of:

	EC 4210	Electro-Optic Systems Engineering	(3-0)
	EC 4600	Advanced Topics in Electromagnetics	(3-0)
	EC 4610	Radar Systems	(3-2)
	EC 4630	Radar Cross Section Prediction and Reduction	(3-0)
	EC 4650	Advanced Electromagnetics	(3-0)
	EC 4660	Electromagnetic Environmental Effects on Communication System Performance	(3-2)
	EC 4680/4690	Radar Electronic Warfare Techniques and Systems	(3-3)

Guidance, Control, and Navigation Systems Option:

Required Courses:

	EC 3310	Optimal Estimation: Sensor and Data Association	(3-1)
	EC 3320	Optimal Control Systems	(3-2)
	EC 4350	Nonlinear Control Systems	(3-2)

At least two of:

	EC 4300	Advanced Topics in Modern Control Systems	(3-0)
	EC 4320	Design of Robust Control Systems	(3-2)
	EC 4330/4340	Navigation, Missile, and Avionics Systems	(2-2)
	EC 4360	Adaptive Control Systems	(3-1)

Solid State Microelectronics and Power Systems Option:

At least two of:

	EC 3130	Electrical Machinery Theory	(4-2)
	EC 3150	Solid State Power Conversion	(3-2)
	EC 3200	Advanced Electronics Engineering	(3-2)

At least two of:

	EC 4130	Advanced Electrical Machinery Systems	(4-2)
	EC 4150	Advanced Solid State Power Conversion	(4-1)
	EC 4220	Introduction to Analog VLSI	(3-1)

Joint Services Electronic Warfare Option:

Required Course:

	EC 3700	Introduction to Joint Services Electronic Warfare	(3-2)

At least four of:

	EC 3310	Optimal Estimation: Sensor and Data Association	(3-1)
	EC 4210	Electro-Optic Systems Engineering	(3-0)
	EC 4330/4340	Navigation, Missile, and Avionics Systems	(2-2)
	EC 4560	Communications ECCM	(3-2)
	EC 4610	Radar Systems	(3-2)
	EC 4630	Radar Cross Section Prediction and Reduction	(3-0)
	EC 4640	Airborne Radar Systems	(3-0)
	EC 4680/4690	Radar Electronic Warfare Techniques and Systems	(3-3)
	EC 4700	Advanced Topics in Electronic Warfare	(3-0)
	SS 3001	Military Applications of Space	(3-2)

Signal Processing Systems Option:

Required Courses:

	EC 3400	Digital Signal Processing	(3-1)
	EC 3410	Discrete-Time Random Signals	(3-1)
	EC 4440	Statistical Digital Signal Processing	(3-1)

At least two of:

	EC 4400	Advanced Topics in Signal Processing	(3-0)
	EC 4410	Speech Signal Processing	(3-1)
	EC 4420	Modern Spectral Analysis	(3-1)
	EC 4450	Sonar Systems Engineering	(4-1)
	EC 4460	Artificial Neural Networks	(3-1)
	EC 4480	Image Processing and Recognition	(3-2)

Signals Intelligence Option:

Required Courses:

	EC 3850	Computer Communications Methods	(3-1)
	EC 3750	SIGINT Systems I	(3-2)

Three required courses in ONE of the following sub-options:

1. *Communications Engineering:*

	EC 3500	Analysis of Random Signals	(4-0)
	EC 3510	Communications Engineering	(3-1)
	EC 4550	Digital Communications	(4-0)

2. *Signal Processing Systems:*

	EC 3400	Digital Signal Processing	(3-1
	EC 3410	Discrete-Time Random Signals	(3-1)
	EC 4570	Signal Detection and Estimation	(4-0)

3. Joint Services Electronic Warfare:

	EC 3600	Electromagnetic Radiation, Scattering, and Propagation	(3-2)
	EC 4610	Radar Systems	(3-2)
	EC 4680	Radar Electronic Warfare Techniques and Systems	(3-3)

Three courses from either of the sub-options not picked or from the following list:
(This satisfies the requirement for two out-of-option courses)

	EC 3210	Introduction to Electro-Optical Engineering	(3-1)
	EC 3310	Optimal Estimation: Sensor and Data Association	(3-1)
	EC 3550	Fiber Optic Systems	(3-1)
	EC 3610	Microwave Engineering	(3-2)
	EC 3630	Radiowave Propagation	(3-0)
	EC 3800	Microprocessor Based System Design	(3-2)
	EC 3840	Introduction to Computer Architecture	(3-2)
	EC 4420	Modern Spectral Analysis	(3-1)
	EC 4440	Statistical Digital Signal Processing	(3-1)
	EC 4560	Communications ECCM	(3-2)
	EC 4580	Coding Information Theory	(4-0)
	EC 4590	Communications Satellite Systems Engineering	(3-0)
	EC 4700	Advanced Topics in Information Warfare	(3-0)
	EC 4750	SIGINT Systems II	(3-4)

One of the following graduate courses in Mathematics:

	MA 3046	Matrix Analysis	(4-1)
	MA 4362	Astrodynamics	(3-0)
	MA 4570	Cryptography	(4-0)